

Conveyors

WAC 296-806-420

Summary

- If your specific conveyor or operation isn't listed here, then follow any general requirements in this section along with the "Requirements for All Machines" found in this chapter, WAC 296-806-200 and WAC 296-806-300.

This section applies to hazards related to conveyors and conveying systems, including bulk material, package, or unit handling types. These requirements are designed to protect employees operating, maintaining, cleaning, and working around conveyors.



Exemption:

- This section doesn't apply to conveyor systems used primarily for moving people.

YOUR RESPONSIBILITY:

To make sure all conveyors in your workplace are constructed, operated, and maintained in a safe manner

GENERAL REQUIREMENTS FOR CONVEYORS

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Summary

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WAC 296-806-420

Rule

GENERAL REQUIREMENTS FOR CONVEYORS

WAC 296-806-42002

Follow these requirements for conveyors

You must

- Construct, operate, and maintain all conveyors according to this chapter and the American National Standards Institute (ANSI) B20.1-1957.
- Make sure all new conveyors constructed after January 1, 2005, meet the requirements of the American Society of Mechanical Engineers (ASME) B20.1-1996.

WAC 296-806-42004

Provide emergency stops on conveyors

You must

- Make sure each conveyor has an emergency stopping device such as an emergency stop button, pull cord, or similar device.
- Make sure each emergency stopping device meets **all** of the following requirements. They must:
 - Stop the conveyor a safe distance from the hazard
 - Be easily identified
 - Directly control that conveyor
 - Require a manual reset
 - **Not** be overridden from another location
 - **Not** require other equipment to be stopped in order to stop the conveyor

-Continued-



WAC 296-806-42004 (Continued)

- Make sure where there's the possibility of an employee falling onto a conveyor, that the emergency stopping device for conveyors feeding or dumping into a hazardous machine such as a barker, saw, hog, or chipper is **at least one** of the following:
 - Under the continuous control of an operator who can't fall onto the conveyor and has full view of the material entrance
 - or**
 - Located where it can be reached from a sitting position on the conveyor where it feeds or dumps into the hazardous machine

WAC 296-806-42006

Label conveyor controls

You must

- Clearly label the function of each conveyor control.



Note:

- Controls and wiring that are no longer used should be removed from control stations.

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WAC 296-806-420

Rule

WAC 296-806-42008

Prohibit riding on conveyors

You must

- Prohibit employees from riding on conveyors.



Exemption:

- You don't need to prohibit riding on an assembly conveyor moving 80 feet or less per minute or a conveyor with a station specifically designed for operating personnel.

WAC 296-806-42010

Provide safe access to conveyors

You must

- Provide a way to safely inspect and maintain conveyors located more than 7 feet from the floor.



Reference:

- Some additional requirements for protecting employees inspecting and maintaining conveyors can be found in:
 - Lockout/Tagout (Control of Hazardous Energy), Chapter 296-803 WAC
 - Personal Fall Arrest Systems, WAC 296-24-88050



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WAC 296-806-420

Rule

WAC 296-806-42012

Provide backstop or anti-runaway devices on incline, decline, or vertical conveyors

You must

- Make sure all incline, decline, or vertical conveyors use backstop or anti-runaway devices when there's a danger of conveyor reversal or runaway.

WAC 296-806-42014

Make only safe alterations to conveyors

You must

- Make sure, when making conveyor alterations, that you don't affect safety characteristics such as emergency stop controls, guards, or the incline of the conveyor, if such changes would create a danger to workers.

WAC 296-806-42016

Inspect and replace worn conveyor parts

You must

- Carefully inspect and replace any conveyor part that shows signs of significant wear before it becomes a hazard.

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WAC 296-806-420

Rule

WAC 296-806-42018

Follow these requirements for replacing conveyor parts

You must

- Make sure replacement conveyor parts are equal to or exceed the manufacturer's specifications.

WAC 296-806-42020

Follow these requirements for spill guards

You must

- Install protective or spill guards wherever conveyors pass next to or over working areas or passageways.
 - These guards must be designed to catch and hold any materials that may become dislodged or fall off.



Reference:

- For specific requirements when conveyors pass over emergency exit routes, see Exit Routes, WAC 296-800-310.



WAC 296-806-42022

Provide pedestrian overpasses for conveyors

You must

- Provide a pedestrian overpass covering the full width of a passageway if **one** of these conditions exists:
 - The working strand of a conveyor crosses within 3 feet of floor level
 - Workers must step over the strand and trough at or below floor level
- Provide a pedestrian overpass where workers can't pass under the conveyor safely.
 - The sides of the crossing platform must have standard railings if **one** of the following exists:
 - The overpass is more than 4 feet high
 - The conveyor feeds a dangerous machine such as saws, chippers, hogs, or galvanizing tanks



Reference:

- For guardrail requirements see Railing, Toeboards, and Cover Specifications, WAC 296-24-75011.

Conveyors

WAC 296-806-420

Rule

WAC 296-806-42024

Guard openings to hoppers and chutes

You must

- Guard all openings to hoppers, chutes, and elevator-type conveyors to prevent workers from:
 - Falling or stepping into them
 - Making any kind of bodily contact with conveyors



Note:

- Grating provided at floor level with no openings larger than 2 inches (50mm) that's strong enough to withstand any load of personnel or trucks that may be imposed upon it, is acceptable guarding.

You must

- Do **all** of the following when dumping operations use chutes or hoppers that are flush with the floor and their use can't be guarded:
 - Place a temporary guardrail around ground or floor-level hoppers when dumping operations are **not** in progress.
 - Post warning signs in a conspicuous location alerting personnel to the presence of an open pit in order to protect employees when dumping operations are in progress.



Reference:

- For guardrail requirements see Railing, Toeboards, and Cover Specifications, WAC 296-24-75011.



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WAC 296-806-420

Rule

WAC 296-806-42026

Install guideposts

You must

- Install guideposts to direct employees driving trucks, loaders, or other equipment to the pit, hopper, or chute.

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WAC 296-806-420

Rule

BELT CONVEYORS

WAC 296-806-42028

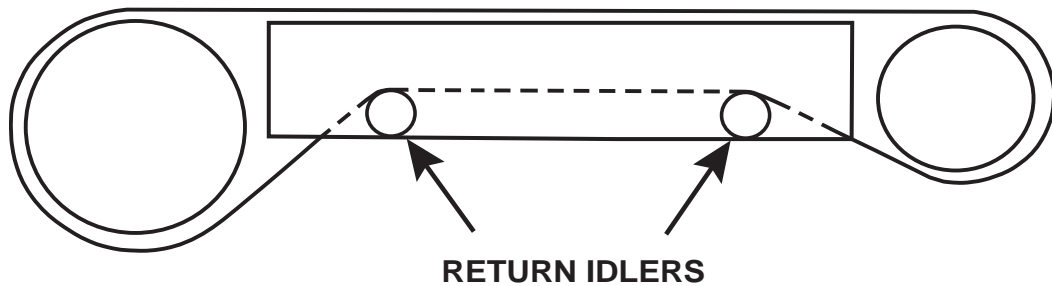
Guard nip points on belt conveyors



Exemption:

- This rule doesn't normally require guards along the conveyor at the point where the belt rides on return rollers, such as return-belt idlers unless hazardous conditions such as long, tight or heavy belts exist.

Illustration 420-1
RETURN BELT IDLERS



WAC 296-806-42028(Continued)

You must

- Place nip point guards at **all** of these points:
 - Where the belt wraps around the pulley
 - At terminals, take-ups, and snub rollers where the belt changes directions at transfers and deflectors
 - At the discharge end
 - At other points where workers may be injured by nip or shear points



Note:

- The practice of applying a belt dressing or other foreign material to a rotating drive pulley or a conveyor belt is hazardous and should be avoided.

WAC 296-806-42030

Install emergency stop controllers on overland belt conveyors

You must

- Install permanent emergency pull cords or similar emergency stop controllers at points where workers are normally stationed along overland belt conveyors.



Note:

- Personnel that patrol overland belt conveyors may use portable emergency stop controllers instead of permanently installed pull cords and push-button stations.



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WAC 296-806-420

Rule

WAC 296-806-42032

Install belt conveyor overpasses

You must

- Install a pedestrian overpass or underpass along the sides of long overland belt conveyors, where there's the most foot traffic.
 - The distance between overpasses shouldn't exceed 300 meters or 1,000 feet.



CHAIN CONVEYORS

WAC 296-806-42034

Safeguard chain conveyors

You must

- Provide safeguards for drive, tail, and idler sprocket pulleys where the chain creates a nip or shear point

WAC 296-806-42036

Guard return strands on chain conveyors

You must

- Provide a way to catch and support the ends of a chain that break over a passageway.
- Provide a strong enough trough to carry the weight from a broken chain on conveyors when return strands operate within 7 feet of the floor.



Conveyors

WAC 296-806-420

Rule

WAC 296-806-42038

Guard chain conveyors that are used as a transfer mechanism

You must

- Guard chain conveyors whose moving chains can't be enclosed without impairing their function by **one** of the following methods:
 - Distance as required in Make sure safeguarding by distance meets these requirements, WAC 296-806-20056
 - Personnel barriers
 - Warning signs where personnel barriers aren't practical



Note:

- Chain conveyors with moving chains that can't be enclosed include those:
 - Mounted within another conveyor
 - Raised and lowered as a transfer mechanism

ELEVATOR CONVEYORS

WAC 296-806-42040

Prevent material from falling off of elevator conveyors

You must

- Install strong guards, screens, or barricades to prevent material from falling in any direction into the shaft way of elevator-type conveyors, except at loading and unloading areas.
- Install automatic shaft way gates or suitable barriers at each floor level where material is loaded or unloaded.



INCLINED RECIPROCATING CONVEYORS (SHAKERS)

WAC 296-806-42042

Provide protection where employees must load shakers

You must

- Provide standard guardrails or snap chains along loading sides of the shaker where personnel must load or unload material.
 - Snap chains must be at least 39 inches high at their lowest point.
- Make sure controls are located so the conveyor can't be started by an employee on the moving part of the conveyor.

WAC 296-806-42044

Provide grating over silo and bunker openings for shuttle conveyors

You must

- Provide grating with openings to match the size of the material being discharged into silos or bunkers. Make sure openings are:
 - Small enough so that workers can't fall through
 - Protected by other effective means if the material size requires openings large enough for a worker to fall through



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WAC 296-806-420

Rule

MOBILE CONVEYORS

WAC 296-806-42046

Guard wheels and rails on mobile conveyors

You must

- Install sweeps in front of the nip points created by the wheels and rails to deflect objects that could derail the conveyor.

WAC 296-806-42048

Prevent hazardous motion on mobile conveyors

You must

- Make sure mobile conveyors have **at least one** of the following to prevent hazardous motion:
 - Brakes
 - Rail clamps
 - Other position-locking devices
- Provide limit switches that will stop travel when exceeding the design limits of rail-mounted mobile conveyors
- Provide rail stops to keep the conveyor from traveling past its designed end location.



WAC 296-806-42050

Provide a detector for mobile conveyors

You must

- Provide a detector to stop conveyor movement when the operation creates a danger of running into a stockpile or other obstacle.

WAC 296-806-42052

Provide safe access on mobile conveyors

You must

- Make sure that access stairways, ladders, and platforms are designed and located to avoid the shear or nip point hazards of the conveyor and moving machinery.

PUSHER-BAR CONVEYORS

WAC 296-806-42054

Guard pusher-bar conveyors

You must

- Provide a guard when hazards exist at each of these points:
 - At the discharge point where the bar passes through the bed
 - Where there's a shear point between the return pusher bar and a frame member



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WAC 296-806-420

Rule

ROLLER CONVEYORS

WAC 296-806-42056

Prohibit walking on roller-type conveyors

You must

- Prohibit employees from walking on the rolls of roller-type conveyors.
- Tread plates or other types of walkways can be used between the rollers as a walking surface for operators when performing their duties.

WAC 296-806-42058

Use speed controls for roller and wheel conveyors

You must

- Avoid safety hazards created by unit or package speeds by **one** of the following methods:
 - Limiting the length of the sloped run
 - Using speed retarders or brakes
 - Other means of providing speed control
- Make sure rollers and wheels are free running to prevent locked wheels from steering or pulling materials to one side or off the conveyor.



WAC 296-806-42060

Safeguard belt-driven live roller conveyors

You must

- Guard belt and roller nip points by **one** of the following methods:
 - Space load-carrying rollers to prevent access to the belt and roller nip points.
 - Insert rods or plates between the rollers to prevent access to the belt and roller nip points.
 - Use rollers that pop out when something contacts the nip point.
 - Distance safeguarding found in:
 - Make sure safeguarding by distance meets these requirements, WAC 296-806-20056.



Reference:

- For nip points and sheer hazards on power-driven (live) roller conveyors see Guard nip points on belt conveyors, WAC 296-806-42028.

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WAC 296-806-420

Rule

SCREW CONVEYORS

WAC 296-806-42062

Guard screw conveyors

You must

- Enclose the rotating screw to prevent contact with the shear points where it passes the sides of the trough or casing
- Guard screw conveyors requiring an open housing by using **one** of the following:
 - Make sure safeguarding by distance meets these requirements, WAC 296-806-20056
 - Make sure guardrails used for safeguarding meet these requirements, WAC 296-806-20058
- Construct feed openings for shovel, front-end loader, or other manual or mechanical equipment so that the conveyor screw is covered by a grating.
 - If the nature of the material is such that a grating can't be used, then the exposed section of the conveyor must be guarded by a railing and warning signs.



SKIP HOISTS

WAC 296-806-42064

Provide slack-cable switches on hoists

You must

- Provide and arrange slack cable switches to cut power to the drive and set the brake when the skip or counterweight hoisting ropes either:
 - Develop slack
 - or**
 - Lose tension due to sticking in the guides, over travel, or for any other reason.

WAC 296-806-42066

Block the skip bucket and counterweight guides

You must

- Make sure the skip bucket and counterweight are blocked in their guides when the brake or any part of the drive train between the brake and the drum shaft are being repaired or replaced.

WAC 296-806-42068

Protect against wire rope coming off sheaves

You must

- Fit all sheaves with sheave guards to prevent the wire rope from coming off under slack cable or similar conditions



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WAC 296-806-420

Rule

SLAT AND ROLLER-SLAT CONVEYORS

WAC 296-806-42070

Safeguard slat and roller-slat conveyors

You must

- Provide **either** of these safeguards at the tail end of a slat conveyor if the slats are above the centerline of the chain:
 - A guard over the hazardous tail end
 - or**
 - Warning signs if guards are impractical because of material flowing over the tail sprocket
- Provide **either** of these safeguards when there's a gap between the slats wide enough to permit access to cross members below the slats:
 - A continuous pan under the slats
 - or**
 - Keep all cross members a safe distance from the slats

TOWED CONVEYORS

WAC 296-806-42072

Provide a safe method for disengaging the tow pin

You must

- Provide a method for the operator to disengage the tow pin from a conveyor pusher without being in front of the cart.



WAC 296-806-42074

Protect employees from moving carts on towed conveyors

You must

- Make sure runaway carts are unable to exit ramps and enter work areas.
- Have a barrier of sufficient strength and height on ramps with pedestrian or traffic aisles to prevent a runaway cart from entering the aisle.
- Have signs warning employees not to enter ramps that don't have pedestrian or traffic aisles.

WAC 296-806-42076

Provide clearances and warnings for carts on towed conveyors

You must

- Provide clearance space for personnel in all of the following:
 - Between the sides of carts
 - Between any load overhanging the side of a cart
 - Any fixed or moving object
- Identify the cart path with floor stripes that are:
 - Parallel to the cart path
 - Arranged so one line is on each side of the path
 - Located a safe distance from the edge of the cart or overhanging load
- Mark reduced clearance areas with appropriate warning signs.



Note:

- An example of a reduced clearance area is an area where a cart goes through a wall opening.

-Continued-



Conveyors

WAC 296-806-420

Rule

WAC 296-806-42076 (Continued)

You must

- Place an appropriate warning on those areas where a cart may unexpectedly change direction, such as switching off the main line into a transfer conveyor or a spur.



Note:

- An example of an appropriate warning would be to use diagonal stripes on the floor between clearance lines.

You must

- Install a sign, signal, or other warning where carts start automatically.

WAC 296-806-42078

Mark projections above the floor

You must

- Mark the area around projections above the floor with appropriate diagonal stripes, warning signs, or both.



Note:

- This is especially important if projections above the floor are unpredictable or occur intermittently.

